


Technical Reclamation Memorandum

TRM # 7

Date: January 7, 1983
From: 
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Division of Reclamation Services



Kentucky Department for
Surface Mining Reclamation
and Enforcement

Subject: Design of Single Spillway Ponds
with No Embankment and
Open Spillways

The Kentucky permanent program regulations at 16:090, and 18:090 Section 5(5) allow the department to establish size and other criteria under which a sediment pond can be designed and constructed with a principal spillway but no emergency spillway (single spillway pond). However, one of the conditions under which the Kentucky permanent regulatory program was approved requires that design and construction criteria for single spillway ponds must have OSM's prior approval before the department can implement 16:090, and 18:090 Section 5(5). Because the review and approval process by OSM on all categories of single spillway ponds may be very time consuming, the Department has decided to initially limit single spillway ponds to Class A structures which (1) have no embankments and (2) have an open channel or weir spillway. Limiting single spillway ponds to this category of structures will result in ponds which have no permanent impounded pool and will ensure that the pond will present no danger to human life or property and will cause insignificant environmental damage if the structure is overtopped by storm flow. This category of structure does not present safety concerns addressed in the OSM single spillway permanent program condition and, allowed OSM to provide quick approval of design and construction criteria for these structures.

This TRM contains criteria for the design and construction of single spillway ponds which have no embankment and an open channel or weir spillway. Other categories of single spillway ponds will be addressed in subsequent TRM's.

Single spillway ponds with no embankment and open spillways include (1) ponds which are constructed entirely by excavation with either an excavated spillway (open channel or weir) or a natural drainage way which functions as a spillway, and (2) ponds which are primarily constructed by excavation but also have a small levee or spur dike to aid in controlling outflow in addition to an excavated spillway or a natural drainage way which functions as a spillway. For excavated ponds, embankment height and storage volume are measured from the lowest point in the natural ground surface to the crest or invert of the spillway. Thus, ponds which have a spillway crest or invert elevation at or below the lowest point in the natural ground surface have no embankment height or storage volume as defined by the permanent program regulations.

The following design and construction criteria apply to excavated single spillway ponds with no embankment and open spillways. The 405 KAR 16:090 regulatory references cited below also apply to the parallel sections of 405 KAR 18:090.

- (1) Ponds which are constructed entirely by excavation (no levee or spur dike to control outflow) are exempt from those portions of 405 KAR 16:090 which specify design criteria for embankments including the regulatory requirements to:

- (a) Provide a minimum freeboard of 1.0 foot above the settled embankment [16:090, Section 5(6)];
 - (b) Increase the constructed height of the dam 5 percent over the design height to allow for settlement [16:090, Section 5(7)];
 - (c) Provide a minimum top width [16:090, Section 5(8)];
 - (d) Provide minimum embankment side slopes [16:090, Section 5(9)];
and
 - (e) Follow foundation and embankment design and construction provisions [16:090, Section 5(10-12)].
- (2) For those cases in which a levee is used to control outflow from an excavated single spillway pond:
- (a) The levee shall be limited to a maximum height of five (5) feet as measured from the lowest point in the natural ground surface to the top of the levee;
 - (b) The spillway shall safely pass the 25-year, 24-hour storm with a minimum freeboard of one (1) foot as measured from the maximum water surface elevation to the top of the levee; and
 - (c) The levee shall meet the embankment design criteria contained in 16:090 including 16:090, Section 5(6-12).
- (3) Excavated single spillway ponds shall meet all other requirements of 405 KAR 16:090 including the Environmental Protection Agency suspended and settleable solids effluent limitations.
- (4) Excavated single spillway ponds which act as a final downstream control point for the permitted area (most downstream sediment pond) must meet the cumulative impact assessment flood control criteria discussed in the Hydrology and Geology Guidelines for the Permanent Regulatory Program and in TRM #2.
- (5) Spillways and spillway exit channels shall be designed and constructed, using channel linings or other appropriate erosion control measures, to convey outflow from the sediment pond to an appropriate natural channel without overtopping and at velocities which will not result in additional contributions of suspended solids to streamflow and to runoff outside the permit area.

Questions concerning this TRM should be addressed to Dick Rohlf (502) 564-2356.